

# Technology Transfer

A I R F O R C E



T E C H N O L O G Y  
T R A N S F E R

**AFRL/XPTT**



# Overview

**What**  
**Why**  
**Who**  
**Process**  
**Mechanisms**  
**Other**  
**programs**  
**How to contact**  
**us**



# Definitions



## Technology Transfer

**The process by which knowledge, facilities, or capabilities developed in one place or for one purpose are transferred and utilized in another place for another purpose to fulfill actual or potential public or domestic needs.**

## Air Force Laboratory

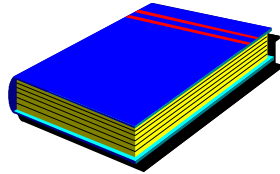
**Any research, development, or engineering facility that is Air Force owned, leased, or otherwise used by the Air Force.**

**Share the Air Force's  
"Tech-Knowledge"  
with those outside  
the Air Force**





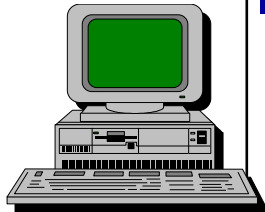
# What is “Tech-Knowledge”?



Written  
Information

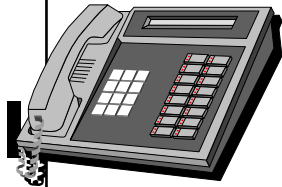


Expertise

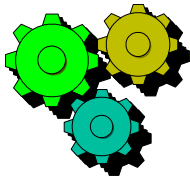


Equipment

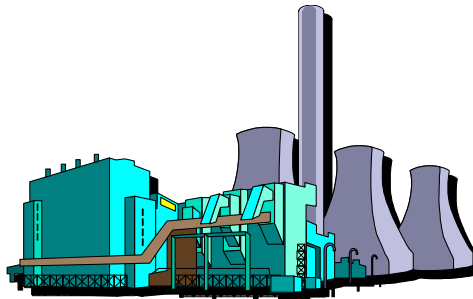
**Technology:  
Scientific or Technological  
Developmental Resources**



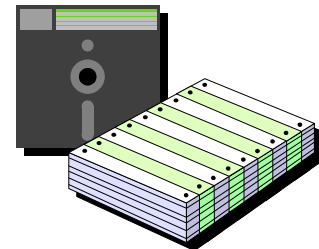
Oral  
Information



Hardware



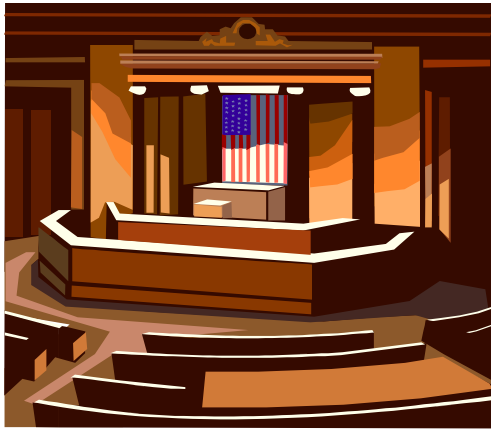
R&D Unique Facilities



Data



# Why Transfer Technology?

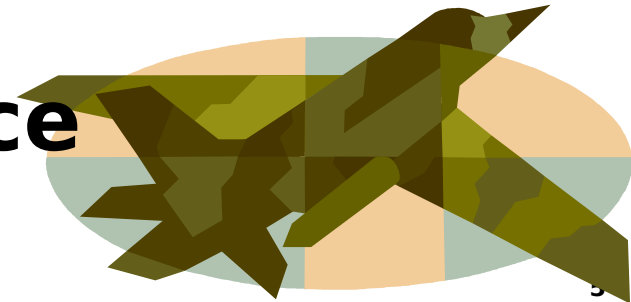


**Public law and DOD  
says “do it”**

**It helps the economy**



**It helps the Air Force**





# Public Laws



- **Stevenson-Wydler Act of 1980**
- **Bayh-Dole Act of 1980**
- **Small Business Act of 1982**
- **Federal T<sup>2</sup> Act of 1986**
- **Omnibus Trade and Competitiveness Act of 1988**
- **National Competitiveness Technology Transfer Act of 1989**
- **American Technology Preeminence Act of 1991**
- **National Technology Transfer & Advancement Act of 1995**
- **Technology Transfer Commercialization Act of 2000**

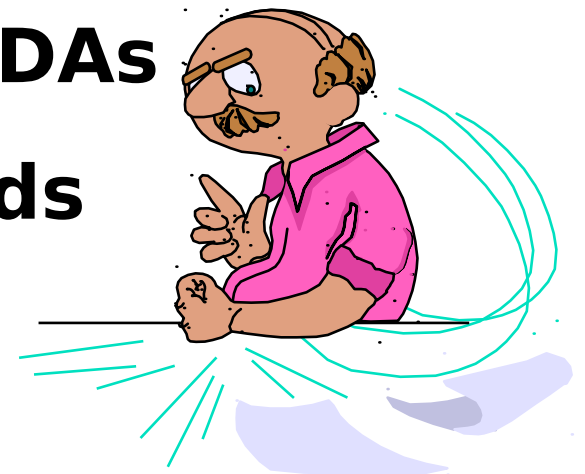




# DoD Guidance



- **DoD Domestic Technology Transfer Program (DoDD 5535.3)**
  - **DoD response to legislation**
  - **DoD responsibilities**
  - **Promotes domestic Tech Transfer activities, such as CRADAs**
  - **Stipulates use of awards and royalties**







# Air Force Guidance



## **AFPD 61-3:** **Domestic Technology Transfer**

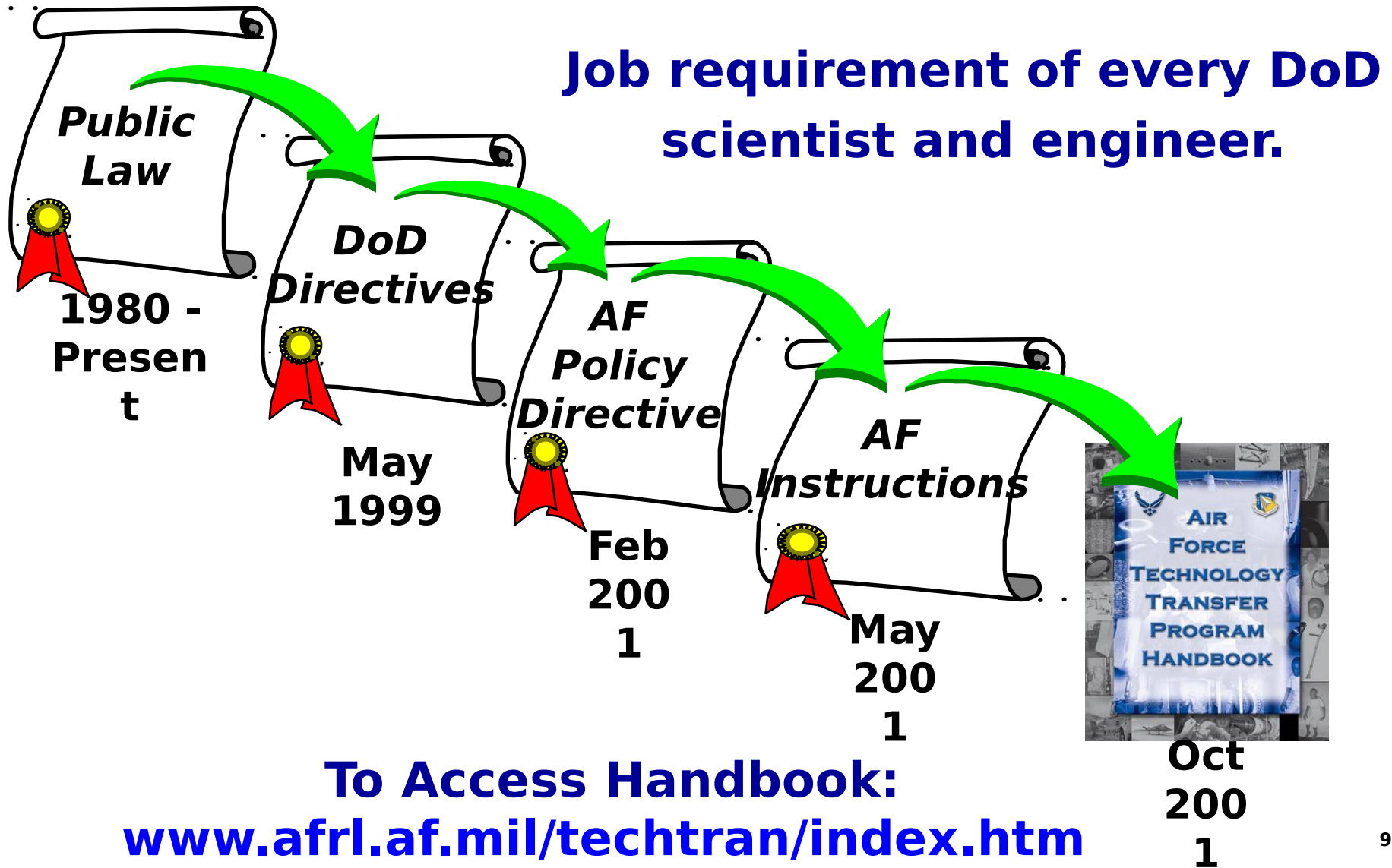
**AFI 61-301:**  
**ORTA responsibilities and royalty  
income**

**AFI 61-302:**  
**CRADA procedures and licensing  
inventions**





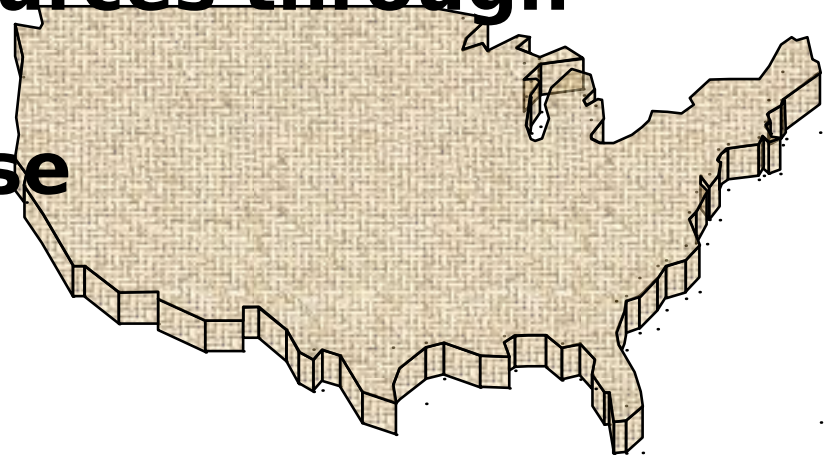
# T<sup>2</sup> Guidance





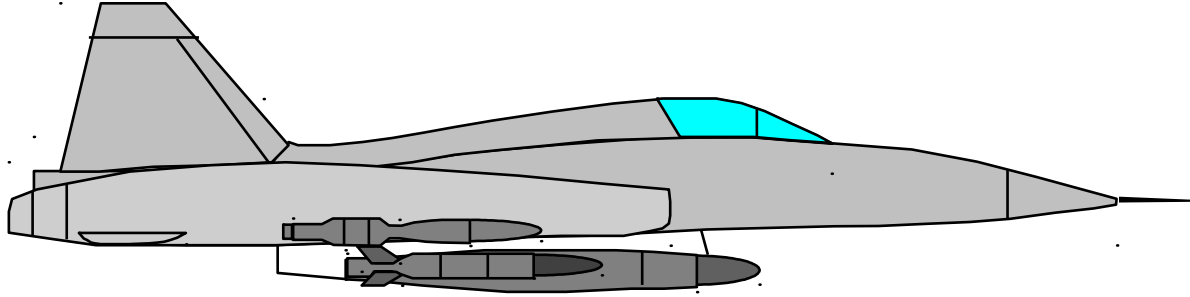
# It Helps the Economy?

- **Economic growth**
- **Improved economic competitiveness**
- **Better quality of life**
- **Technology superiority**
- **Leveraging of resources through partnerships**
- **Build industrial base**





# It Helps the Air Force?



- **Help in meeting mission requirements**
- **Leveraging of commercial resources**
- **Building industrial base, lowering costs**
- **Increase rate of return of federal R&D resources**
- **Improved knowledge base**



# T<sup>2</sup> Goals

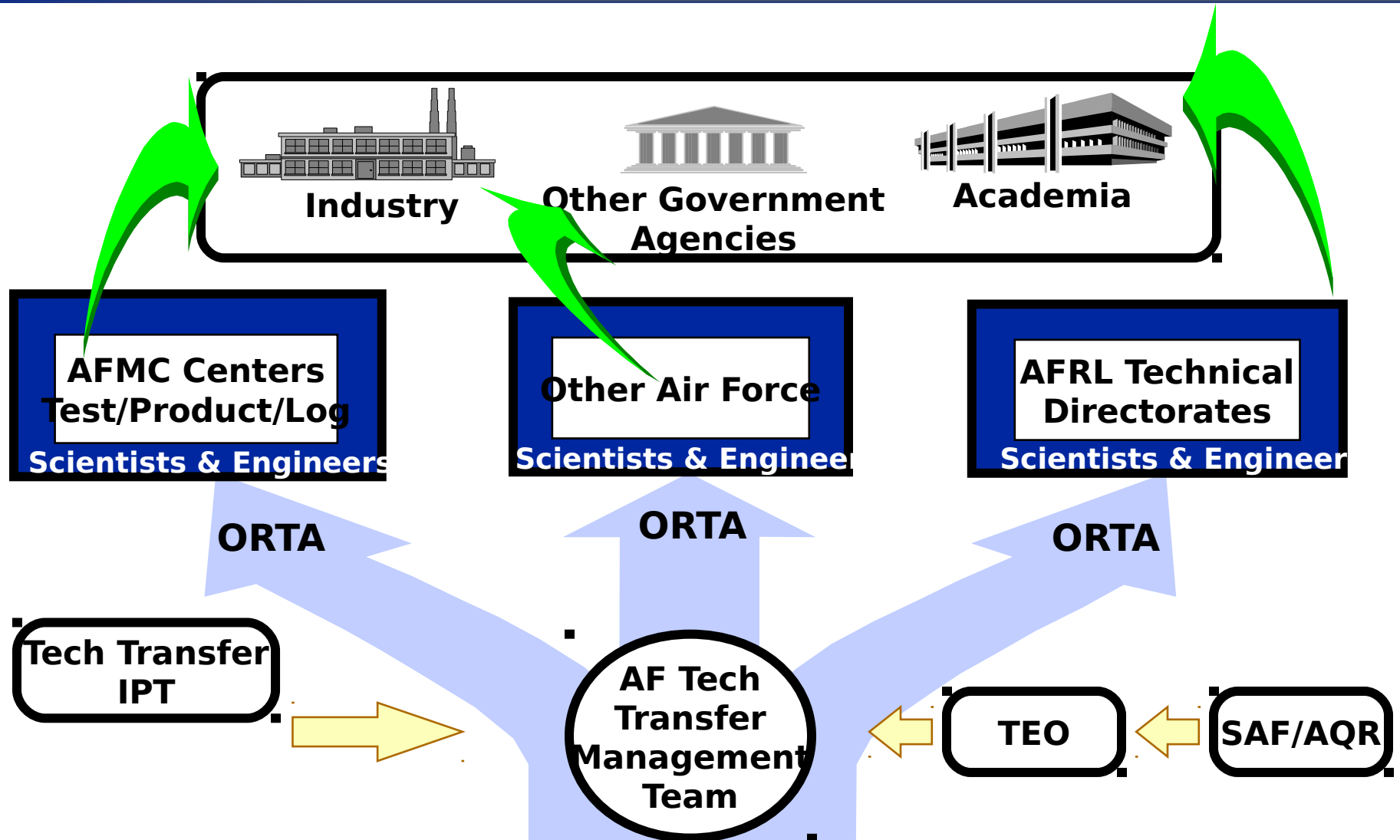


- 1. Integrate T<sup>2</sup> into the laboratory acquisition strategy**
- 2. Increase patent and licensing activities**
- 3. Market laboratory resources & technologies**
- 4. Promote technology transfer training**
- 5. Share AF technology with private and public sectors**
- 6. Integrate T<sup>2</sup> into the AF battlelabs and others**





# The Transfer Organization





# Responsibilities



## ➡ SAF/AQR

- ➡ OPR for T<sup>2</sup> program
- ➡ Establishes policy & procedures
- ➡ Reviews T<sup>2</sup> program for overall effectiveness
- ➡ Interfaces with OSD, SAF (AQ and PEOs) and other government

## ➡ AF T2 Management Team AFRL/XPTT

- ➡ Implements the execution of the T<sup>2</sup> program
- ➡ Provides policy and guidance to the field
- ➡ Chairs the TTIPT
- ➡ Interfaces with DoD and other component managers
- ➡ Manages the DoD Partnership Intermediary TechLink



# ORTA - Focal Point for T<sup>2</sup>



## *Inside the Lab*

**R&D Staff**

**Lab Management**

**Public Affairs**

**Legal Staff**

**Procurement  
Staff**

**Human  
Resources**

**ORTA**

**Office of  
Research  
&  
Technolog  
y**

- Supports S&ES
- Coordinates transfer activity
- Assists non-AF
- Acts as intermediary

**Application**

## *Outside the Lab*

**Private Sector**

**Academia**

**State and Local  
Organizations**

**National  
Networks**

**Professional and  
Trade Groups**

**Other ORTAs**





# AF Scientists and Engineers



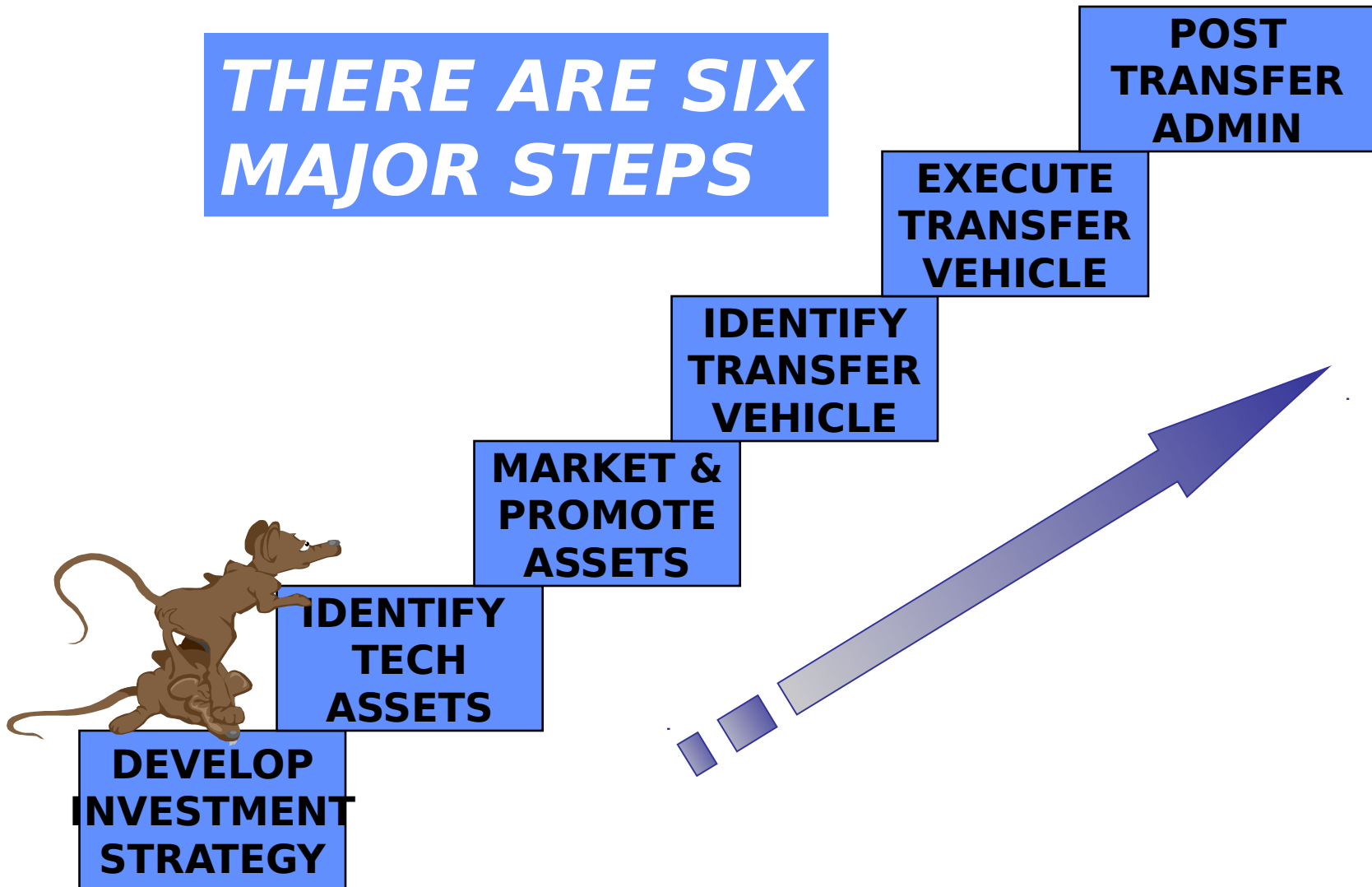
- **Provide ideas, develop technology**
- **Identify potential commercial applications**
- **Actively support technology transfer**
  - **As required by law and AF policy**
- **Work with a team of Tech Transfer professionals**
  - **ORTA, AF T<sup>2</sup> Management Team, etc.**



# The Master Process

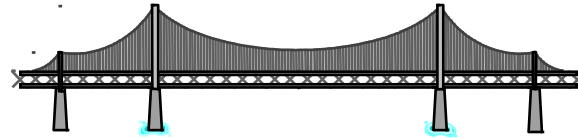
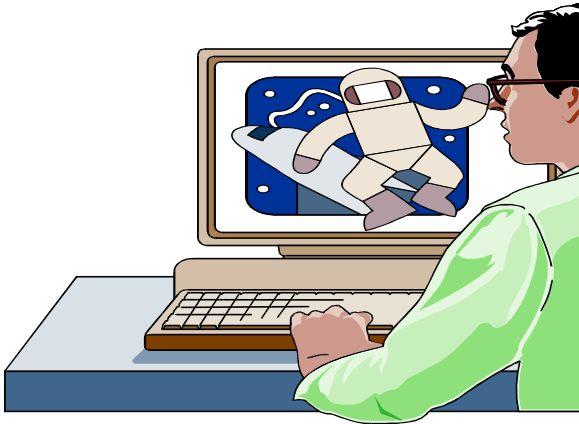


***THERE ARE SIX  
MAJOR STEPS***





# Linking Technology with the Mission and Marketplace



## Laboratory Resources Intermediaries

- Technology
- Expertise
- Facilities
- Equipment
- Data

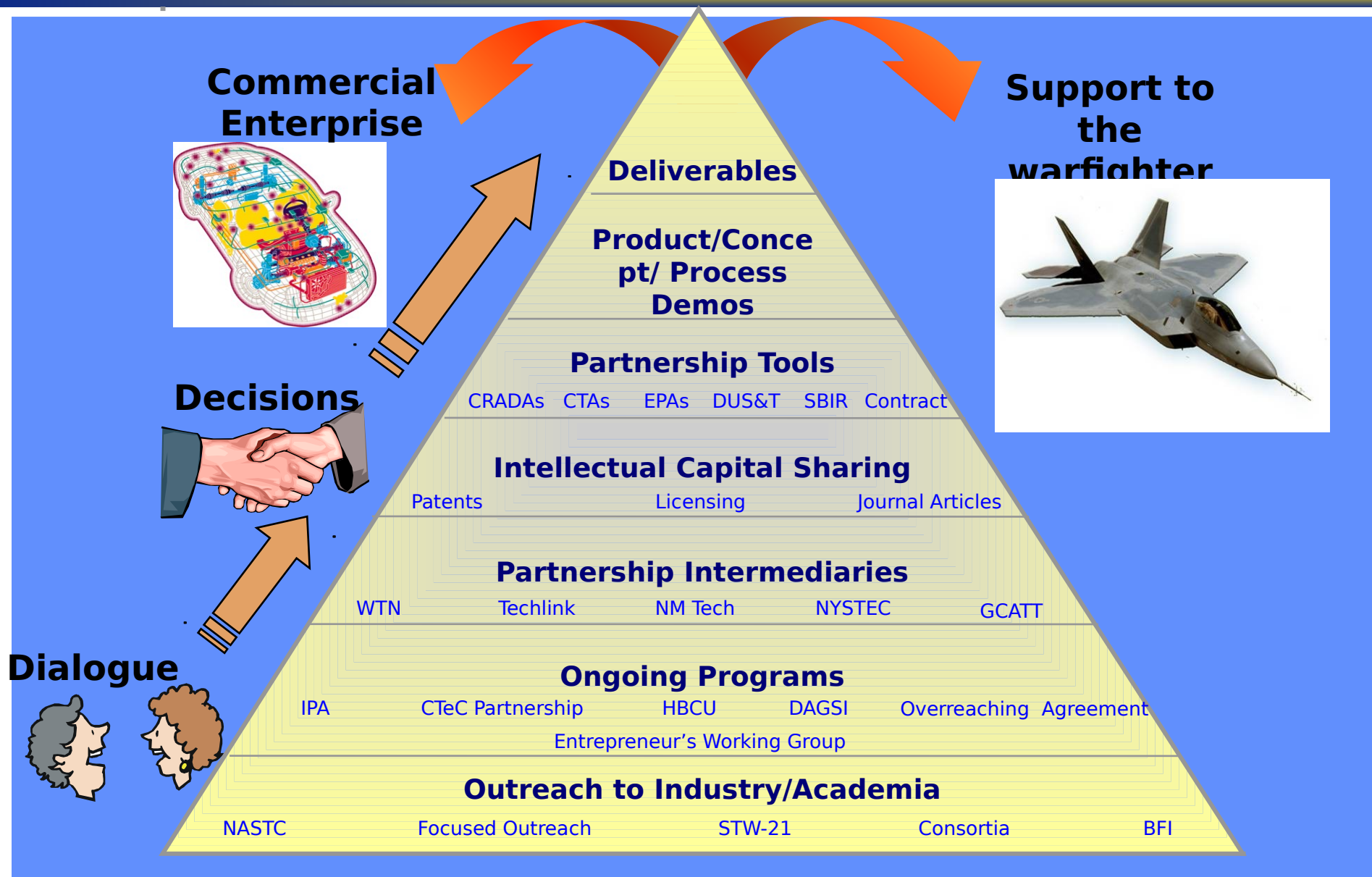
- GCATT
- New Mexico Tech
- NYSTEC
- TechLink
- Federal Laboratory Consortium (FLC)
- Regional T2 Centers

## Industry

- Private Industry
- Public Sector
- Academia



# Developing Partnerships





# Agreement Mechanisms



**Cooperative  
Research  
and Development  
Agreement**

**Patent License  
Agreement**

**MOU/MOA**

**Commercial Test  
Agreement**



**Cooperative  
Agreement**

**SBIR**

**DUS&T**

**IR&D**

**Education  
Partnership  
Agreement**



# **Cooperative Research and Development Agreements (CRADAs)**



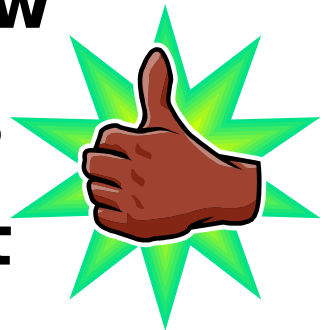
- **Authorizes exchange of personnel, services, facilities, equipment or other resources toward the conduct of specified R&D effort consistent with lab mission**
- **Authorizes parties to determine rights in inventions, patents and other intellectual property**
- **Not a procurement contract/grant**
- **Trade secret and commercial and financial information protected from disclosure under the Freedom of Information Act**
- **Preference for small business and businesses located in the US**
- **Allows for Quid Pro Quo**



# **+ Benefits of CRADAs +**



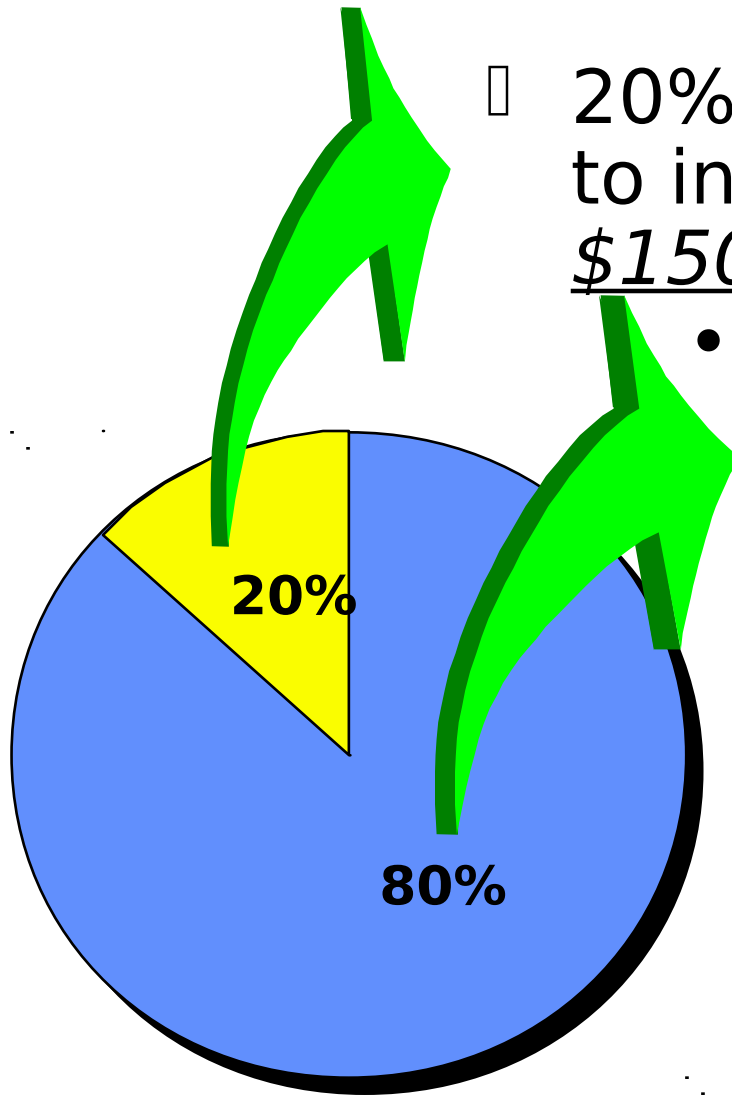
- **Flexible mechanism for transferring federally funded R&D**
- **Provides a team approach to new processes/products**
- **Opens channels of communication on respective needs**
- **Able to leverage resources: personnel, facilities, equipment and know-how**
- **Provides exclusive patent licenses**
- **Enhances mission accomplishment**







# CRADAS with Patents



□ 20% of royalty income to inventor, up to \$150K/year

- **Balance to organization for:**

- **Incidental administrative expenses**
- **Rewarding technical employees**
- **Promoting scientific exchange**
- **Funding Tech Transfer education & training**



# CRADAs without Patents



- **Money goes to the organization**
  - Reimburse costs & incidental expenses
  - Education & training funds
- **Can receive non-monetary like data**
- **Promote scientific exchange**





# License Agreements



- **Negotiated by tech transfer focal points assisted by patent counsel for Government-owned inventions**
- **Government purpose license normally retained**
- **Government usually receives royalties**

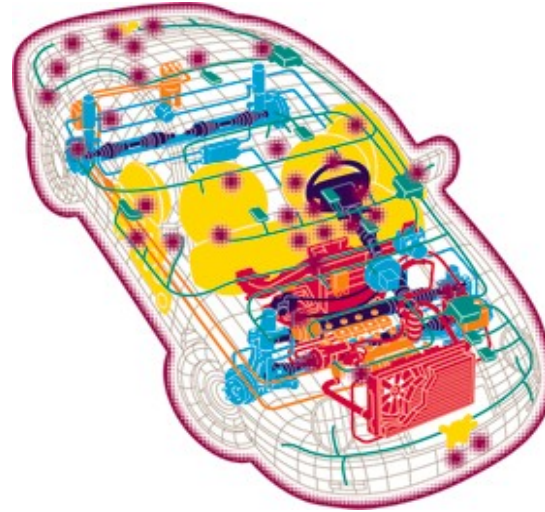




# T<sup>2</sup> Successes



## Utilization of Test Facilities



## Brake-by-Wire

## Vein Viewing Technology



## All Composite



## Forced Air Deicing





# Small Business Innovation

\$250 + M per year  
**Research**



## Phase I

- **Concept Feasibility**
- **≤ \$100K**
- **9 Months**

## Phase II Enhancement

- **≤ \$500K matching**
- **≤ 1 Year**

## Phase II

- **Concept Development**
- **≤ \$750K**
- **2 Years**

## Phase III

- **Product ready for insertion**

**Fast Track**







# Air Force STTR Program

\$25 + M per year



## Process overview

### Phase I

- Concept Feasibility
- $\leq$  \$100K
- 9 Months

**STTR requires  
teaming  
between Small  
Business and  
research  
institutions**

### Phase II

- Concept Development
- $\leq$  \$750K
- 2 Years

### Phase III

- Technologies  
ready for next  
level of R&D

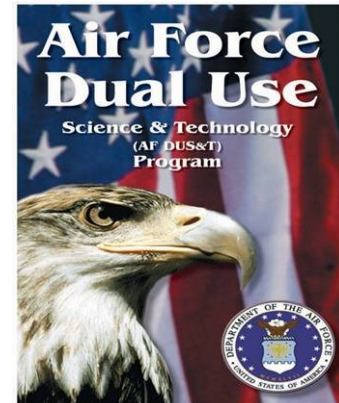
**Air Force  
focuses STTR  
on basic (6.1)  
research**



# Dual Use Science & Technology (DUS&T)



- **What it is**
  - **Joint AF and industry technology development program that leverages AF investment**
- **Program Established by Congress in FY 1997**
  - **Directed that a senior DoD official oversee dual use investments to meet war-fighting needs; DDR&E was appointed to that position**
  - **Objective was to make DUS&T a normal way of doing business**
- **Current Status**
  - **Approximately \$1 Billion invested in more than 350 projects**
  - **AF DUS&T Program Forecasted to Continue to FY07**
  - **Legislative directive to pursue Dual Use S&T development and have senior DoD oversight remains**



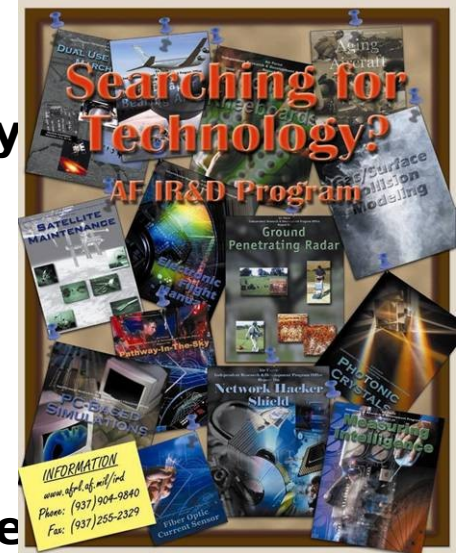




# Independent Research & Development (IR&D)

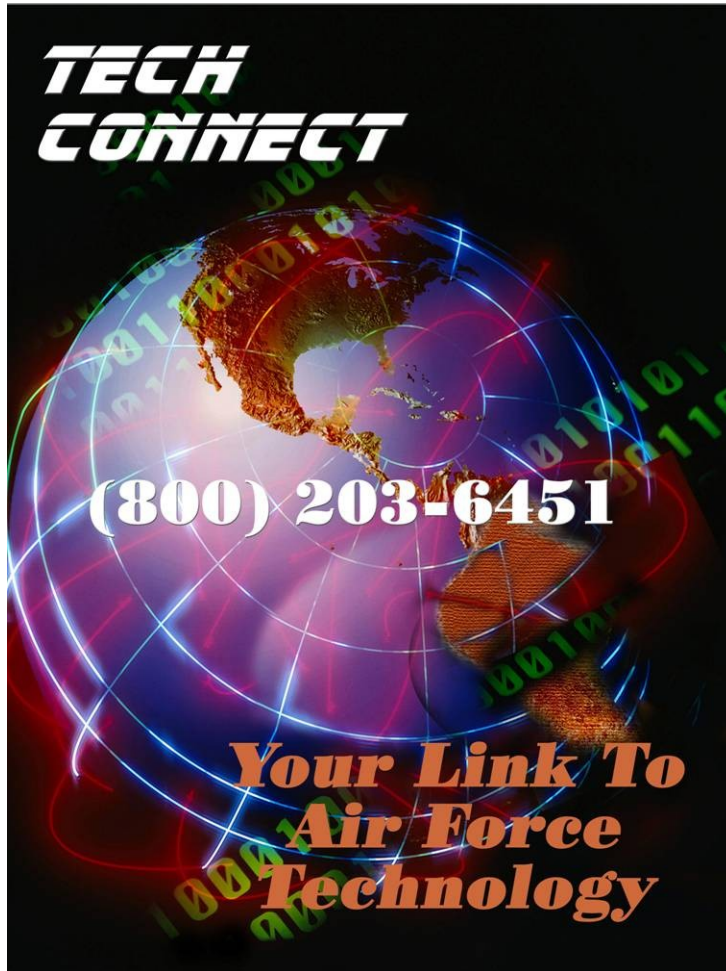


- **What it does**
  - Identifies technologies developed by industry
- **Customers & Stakeholders**
  - Gov't - all TDs, ACC, AMC, ALCs
  - Industry
- **Purpose**
  - Strengthen national defense industrial and technology base
  - Promote effective use of advanced technologies developed through industry IR&D efforts
  - Encourage industry to invest IR&D resources to advance the state-of-the-art in weapon system development
  - Improve AF/Industry communications, in the areas of AF R&D requirements and their potential technological solutions





# T<sup>2</sup> Organizations



## Tech Connect

AFRL Technology  
Information  
Clearinghouse

- Serves government, industry & academia
  - Free service
  - Helps find AF & other government focal points in specific S&T areas
  - Identifies tech transfer opportunities
- Place requests via phone, fax, e-mail or home page
  - [afteccon@wpafb.af.mil](mailto:afteccon@wpafb.af.mil)

**1-800-203-6451**  
[www.af.mil/techconn/index.htm](http://www.af.mil/techconn/index.htm)



# Other T<sup>2</sup> Organizations



- **Federal Laboratory Consortium (FLC)**
  - Over 700 member research labs and centers from 17 federal departments and agencies
  - Promotes rapid movement of technology from federal labs into mainstream of U.S. economy through various mechanisms and incentives
  - Contact Info: 1-865-667-7727 or [www.federallabs.org](http://www.federallabs.org)
- **Regional Technology Transfer Centers (RTTCs)**
  - Established in 1991 to concentrate on technology needs of regional companies and industries
  - Operated by a university or nonprofit organization in cooperation with the FLC
  - Mirrors FLC regional organization
  - Contact Info: 1-800-472-6785



# Other T<sup>2</sup> Organizations



- **Robert C. Byrd National Technology Transfer Center (NTTC)**
  - **Founded in 1989**
  - **Independent organization funded by NASA/Wheeling Jesuit University**
  - **Matches technology needs with federal lab resources by providing:**
    - **Technology evaluation and commercialization services**
    - **Professional development programs**
    - **Data services**
  - **Contact Info: 1-800-472-6785**



# How to Reach Us

**Air Force Research Laboratory  
Technology Transfer Office  
Building 16, Room 107  
2275 D Street  
WPAFB, OH 45433-7226**

***Air Force T<sup>2</sup> Program Manager: Doug Blair***  
**(937) 986-9176 Email: [Douglas.Blair@wpafb.af.mil](mailto:Douglas.Blair@wpafb.af.mil)**

**On the Web: [www.afrl.af.mil](http://www.afrl.af.mil)**

**“The Air Force Research  
Laboratory  
is Your Laboratory!”**



# Summary



## Keys to Technology Transfer Success

- Establish technology transfer strategy complementary to lab's investment strategy
- Identify technologies with commercial potential
- Promote resources to target audience
- Determine an optimal technology transfer strategy
- Accomplish transfer
- Implement effective post-transfer effort





# Conclusion



- **T<sup>2</sup> is an Air Force acquisition strategy that supports the warfighter**
- **T<sup>2</sup> provides a return on our AF S&T investment and enhances economic development**

**A I R F O R C E**



**T E C H N O L O G Y  
T R A N S F E R**





# Back-Up Charts





# **Stevenson-Wydler Technology Innovation Act of 1980**



- **Made it easier for federal labs to transfer technology to non-Federal parties**
- **Focused on dissemination of information**
- **Required federal laboratories to take an active role in technical cooperation**
- **Established Offices of Research and Technology Applications (ORTAs)**





# Bayh-Dole Act of 1980



- **Permitted universities, not-for-profits, and small businesses to obtain title to inventions developed with governmental support**
- **Provided intellectual property protection from public dissemination and Freedom of Information Act (FOIA)**
- **Allowed GOGO laboratories to grant exclusive licenses to patents**





# **Small Business Innovation Development Act of 1982**



- **Established the Small Business Innovation Research Program (SBIR)**
- **Required agencies to provide special funds for small business R&D connected to the agencies' mission**





# Federal T<sup>2</sup> Act of 1986



- **Made T<sup>2</sup> a responsibility of all federal laboratory scientists and engineers**
- **Legislated a charter for the FLC**
- **Empowered each agency to give the directors of GOGO laboratories authority to enter into cooperative R&D agreements and negotiate licensing agreements**
- **Provided for exchanging laboratory personnel, services, and equipment with their research partners**
- **Required that government-employed inventors share in royalties from patent licenses**



# **Omnibus Trade and Competitiveness Act of 1988**



- **Placed emphasis on the need for public/private cooperation on assuring full use of results and resources**
- **Established centers for transferring manufacturing technology**
- **Established Industrial Extension Services within states & an information clearing house on successful state & local technology programs**
- **Extended royalties to non-government employees of federal labs**
- **Established NIST and broadened its T<sup>2</sup> role**



# National Competitiveness Technology Transfer Act of 1989



- **Granted GOCO federal laboratories opportunities to enter into CRADAs**
- **Allowed information and innovations resulting from CRADAs to be protected from disclosure**
- **Provided a technology transfer mission for the nuclear weapons laboratories**

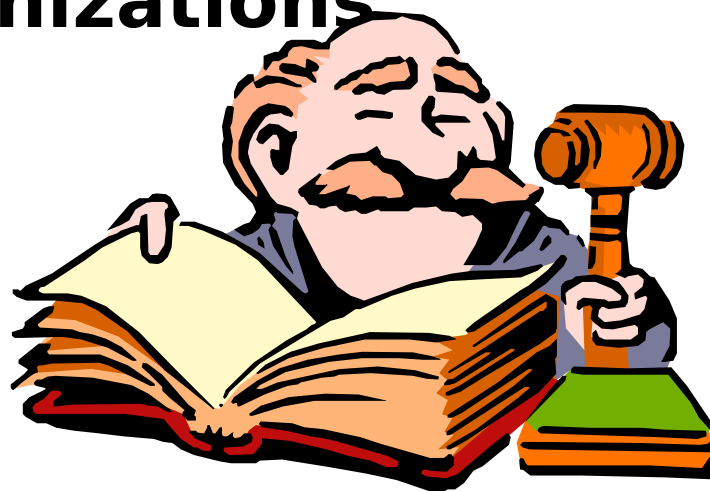




# American Technology Preeminence Act of 1991



- **Allowed CRADA participants to exchange intellectual property**
- **Allowed lab directors to give excess equipment to educational institutions or nonprofit organizations**







# **Small Business Research and Development Enhancement Act**



- **In 1992 it established the Small Business Technology Transfer (STTR), at DoD, DoE, HHS, NASA, and NSF**
- **Required each of the five agencies to fund cooperative R&D projects involving a small company and a researcher at a university, federally-funded R&D center, or nonprofit research center**



# National Technology Transfer and Advancement Act of 1995



- **Gave collaborating party in a CRADA the right to license an invention resulting from joint research**
- **CRADA partner may retain title to an invention made solely by its employees in exchange for granting the government a worldwide license to use the invention**
- **Increased annual limit of of lab royalty payments per inventor from \$100K to \$150K**
- **Provided FLC with permanent funding from government agencies**



# Technology Transfer Commercialization Act of 2000



- **Requires licensee to make a commitment to achieve practical application of the invention within a reasonable time**
- **Requires an agency to provide a 15-day public notice before granting an exclusive or partially exclusive license (except licensing of an invention made under a CRADA)**
- **Permits federal laboratories to grant a license to a federally owned invention that was created prior to signing the CRADA**
- **Increased flexibility for partnership intermediaries**